



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555
July 14, 1976

Honorable Marcus A. Rowden
Chairman
US Nuclear Regulatory Commission
Washington, DC 20555

Subject: REPORT ON WESTINGHOUSE ELECTRIC CORPORATION REFERENCE SAFETY
ANALYSIS REPORT, RESAR-3S

Dear Mr. Rowden:

At its 195th meeting, July 8-10, 1976, the Advisory Committee on Reactor Safeguards completed its review of the Westinghouse Electric Corporation's application for a Preliminary Design Approval (PDA) for a standardized nuclear steam supply system consisting of a pressurized water reactor as described in its Reference Safety Analysis Report, RESAR-3S. A subcommittee meeting was held with representatives of the Applicant and the Nuclear Regulatory Commission (NRC) Staff in Washington, DC, on June 16, 1976. The Committee had the benefit of discussions with representatives of the NRC Staff and the Westinghouse Electric Corporation. The Committee also had the benefit of the documents listed below.

RESAR-3S is a Westinghouse standardized four-loop, single-unit nuclear steam supply system with a core thermal power of 3411 MWt. Systems within the scope of RESAR-3S include the reactor core, reactor coolant system and supports, chemical and volume control system, emergency core cooling system, boron recycle system, residual heat removal system, fuel handling system, and associated instrumentation and controls for these systems. RESAR-3S is similar to the nuclear steam supply system of the SNUPPS projects, reviewed in ACRS reports of September 17, October 16, and December 11, 1975. The ACRS report of September 18, 1975 reviewed the Westinghouse nuclear steam supply system RESAR-41. Significant features, other than those associated with the higher power level, which were incorporated in RESAR-41 but are not in RESAR-3S, include longer fuel assemblies, a rapid refueling system, an emergency boration system, and the use of three independent injection trains in the emergency core cooling system (ECCS).

RESAR-3S has been designed for application to an envelope of plant sites which includes provision for a Safe Shutdown Earthquake with a maximum horizontal ground acceleration of 0.4g.

RESAR-3S provides for those safety-related interface requirements that are essential to designing the balance of plant to be consistent with the assumptions used in the accident analyses. Since the utility-applicant is responsible for instituting the quality assurance programs necessary to assure that all safety-related design requirements have been met, these matters will be reviewed in more detail with the utility-applicants on a case-by-case basis. The Committee recommends that during design, procurement, construction, and startup, timely and appropriate interdisciplinary system analyses be carried out to assure complete functional compatibility across each interface for the entire spectrum of anticipated operations and postulated design basis accident conditions. For multiple reactor units at a single station, the Committee anticipates that safety-related items in RESAR-3S would be separately provided for each reactor unit.

An issue to be resolved prior to preliminary design approval for RESAR-3S involves the possibility of a single failure leading to the loss of the residual heat removal system. The Committee recommends that this matter be resolved in a manner satisfactory to the NRC Staff and wishes to be kept informed.

The Committee recommends that Westinghouse emphasize analytical and experimental programs to substantiate the conservatism in the current Westinghouse ECCS evaluation model and to establish the accuracy and uncertainties in their best-estimate calculations. Timely progress reports should be provided on the performance of the 17x17 fuel, the control systems, improvements in the best estimate analyses, test verification of analytical methods, and reliability studies undertaken to establish meaningful improvements in components, systems, and arrangements for ECC systems and the dependent auxiliaries necessary to sustain the heat transport systems. The Committee recommends that if studies establish that ECCS improvements, such as obtainable from higher reflooding rates, can be achieved, consideration should be given to incorporating them into RESAR-3S.

Further review should be made on the adequacy of the RESAR-3S provisions for the maintenance, inspection, and operational needs of the plant throughout its service life and for eventual decommissioning. In particular, the Committee believes that the NRC Staff and the Westinghouse Electric Corporation should review methods and procedures for minimizing, and, if necessary, for removing accumulations of radioactive contamination so that maintenance and inspection programs can be more effectively and safely carried out.

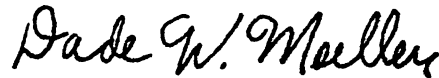
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The Committee believes that Westinghouse and the NRC Staff should continue to review RESAR-3S for design changes that will further improve protection against sabotage.

Generic problems relating to large water reactors are discussed in the Committee's report dated April 16, 1976. The Committee believes that procedures should be developed to incorporate approved resolution of these items into RESAR-3S.

The Committee believes that, subject to the above comments, RESAR-3S can be successfully engineered to serve as a reference system.

Sincerely yours,



Dade W. Moeller
Chairman

REFERENCES

1. Westinghouse Electric Corporation, "Reference Safety Analysis-3S (RESAR-3S)", Volumes 1-8, July, 1975.
2. Amendments 1-10 to RESAR-3S.
3. USNRC, "Report to the Advisory Committee on Reactor Safeguards in the Matter of Westinghouse Electric Corporation Reference Safety Analysis Report, RESAR-3S," May 25, 1976.